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ABSTRACT

Fifty-two students from two universities who had demonstrated mastery of the use of behavioral objectives were randomly assigned either ten knowledge level objectives (K), ten above knowledge level objectives (A), or to a non-objectives control group (C). All were tested on the same prose material using knowledge and above knowledge level items correlated with each objective. Results of the 3 X 2 analysis of variance indicated significant main and interaction effects beyond the 0.05 level on the knowledge level test. A Scheffe' analysis of the main effect revealed that the K group out performed the A group and the Scheffe' analysis of interaction showed that one A group performed significantly worse than one K group. A questionnaire revealed no significant differences in learning strategies employed. (Author)

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THE EFFECTS OF BEHAVIORAL OBJECTIVES ON THE ACHIEVEMENT OF STUDENTS KNOWLEDGEABLE ABOUT THE USE OF OBJECTIVES

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The use of behavioral objectives is a frequently debated issue in education today. Advocates claim that behavioral objectives serve to communicate clearly the goals of instruction to all concerned; to help teachers decide the merit of instructional procedures; to allow teachers to assess individual learner differences; and to enable students to prepare more effectively for formal evaluations (Popham, 1969). Critics, of course, dispute these claims and suggest that objectives will have a deleterious effect. Clearly, the question of the role of behavior objectives in learning and instruction is an empirical one and not to be settled by discussion alone.

A recent review (Duchastel and Merrill, 1973) reported the findings of studies examining the effects of behavioral objectives on student learning. The results of these studies were inconsistent in demonstrating a facilitative effect of objectives on learning. These studies examined a number of different variables such as the degree of specificity of the objectives (e.g. Dalis, 1970), the type of learning involved in the task (e.g. Jenkins and Deno, 1971; Yelon and Schmidt, 1971), as well as the intractions between the availability of objectives and particular learner characteristics (Cook, 1969; Merrill and Towle, 1971). None of these studies, however, attempted to give prior training to the subjects in the use of behavioral

objectives and thus, one of the possible reasons for the failure of previous studies to demonstrate consistent facilitative effects may have been due to the fact that the students simply did not understand the function of behavioral objectives or how to use objectives to facilitate their own learning. This present study attempted to rectify this oversight by training students to mastery one the use of behavioral objectives prior to investigating the effects of behavioral objectives on learning.

Method

Fifty-two students were the subjects in this study. Twenty-eight were enrolled in a graduate education course at one university, the remainder were enrolled in an undergraduate education course at another. Prior to the actual experiment, all students were given a three hour minicourse on the use of behavioral objectives. In order to be included in the data analysis, the student had to successfully accomplish each of the following two behavioral objectives:

> Given a list of eight objectives and 16 questions, the student will be able to select from the question list the one that would best measure the attainment of each of the objectives. Mastery is at least six of the eight correct.
>
> Given three behavioral objectives the student will write a question for each objective such that it measures the behavior stated in that objective, under the condition specified in that objective, and to the degree stated in the objective. Mastery is at least two questions correctly written.

Efforts were made to standardize the teaching toward these two objectives as much as possible. Results on the objectives were not communicated to the students until the day following the experiment.

The experiment actually occurred on the day after the minicourse. All students in attendance participated in the experiment but only those subjects who achieved mastery on both the above stated objectives were included in the data analysis, Fewer than ten per cent of the students failed to reach criterion on the above objectives.

On the day of the experiment, all students, when seated, were randomly assigned a large manila envelope containing a set of directions and an abridged copy of the article "Learning for Mastery" (Bloom, 1969). The article was abridged to eliminate all underlinings of important points

and was reduced to approximately two-thirds of its original length. After everyone had received an envelope and before anyone was allowed to open that envelope the following instructions were read aloud:

> "Today I am going to ask you to participate in a study looking at the different ways in which people learn from printed materials. Each of you has before you a packet which contains a set of directions and an article called "Learning for Mastery." Please print your name on the outside of the packet. In a moment I will ask you to open the packet and to read the directions. Each of you should try to follow the directions before you in reading and learning the content of the article. Please feel free to use whatever learning strategies you believe will help you to learn the article best. If you wish to write on the article you may. Each of you will be asked to take a test on the article and respond to a questionnaire. You may have up to 50 minutes to learn the article but no more. Whenever you feel you are ready to take the test before 50 minutes is up, come up to the front of the room, give me the packet containing both the directions and article and I'll give you the test and questionnaire. Please do the best you can. If you have any questions I'll be glad to come around and answer them individually. Open your envelope and begin. Please be sure to read the directions enclosed before you read the article."

Each subject received one of three sets of directions in the envelope. The directions for the control group (C) instructed them to simply read and study the article for a test. One experimental group (K) received a set of ten knowledge level objectives and were instructed to study the article for a test of the objectives. The second experimental group (A) received a set of ten above knowledge level objectives and were instructed to study the article for a test on those objectives. All objectives followed the sequence of the article.

Those who finished studying and came up to the instructor before the 50 minute reading time limit had their packet collected and were handed a copy of the criterion test and the questionnaire. Packets were collected from those who had not finished at the time limit and the tests and questionnaires were distributed to those not having them. The reading time was noted on the answer sheet. The total class period, like every day, lasted 90 minutes which proved to be sufficient.

All subjectes received the same 20 item four alternatives multiple choice criterion test. Ten of the items sampled each of the knowledge level objectives and the other ten sampled each of the above knowledge level objectives. The order of items for the test was randomly assigned from the total item pool. The objectives and test items had been independently judged to be either at the knowledge level or above the knowledge level without rater disagreement. An item analysis of the criterion test revealed no negatively discriminating items.

All subjects responded to an eight item questionnaire. The seven multiple-choice items had either five or six alternatives. Responses were collected to assess the Ss perception of (1) their prior familiarity with the ideas in the article, (2) their degree of agreement with the ideas in the article, (3) their degree of interest in the article, (4) the reading difficulty level of the

article, (5) the degree to which the objectives helped in preparing for the test, (6) their perception of the effect of objectives on their study time and (7) their predicted effect on their achievement in other courses if they had objectives. The final question was open-ended and attempted to identify the learning strategy they employed.

Results

The means and standard deviations of the groups involved in the study are presented in Table 1.

Insert table 1 here

The three (kinds of objectives) X 2 (schools) factorial design for three dependent variables (score on the knowledge level test, score on the above knowledge level test, and time spent reading the article) were first analyzed using a multivariate analysis (MANOVA) technique. The absence of any significant canonical variates for kinds of objective ($F = 2.00$, $df = 6/88$, $p < .07$), school ($F = 1.53$, $df = 6.88$, $p < .11$) suggests that there was no better fitting hyperplane which separates the levels of the independent variables.

The results of the univariate analysis are contained in Table 2. Significant effects were obtained for the

Insert table 2 here

knowledge level dependent variable only. Both the main effect of type of objective ($F = 4.48$, $df = 2/46$) and the intraction of objective type and university were significant ($F = 3.93$, $df = 2/46$) at the $p < .05$ level. A Scheffe comparison of treatment means showed that subjects receiving above knowledge objectives ($F = 2.96$, $df = 2/46$, $p < .05$). Scheffe's comparisons of cells in the interaction term showed a significant difference with subjects receiving knowledge level objectives for University I only, outperforming subjects receiving above knowledge

objectives ($F = 3.75$, $df = 5/46$, p .05).

A chi square analysis of the questionnaire data resulted in differences significant beyond the .05 level for two of the seven questions. The groups differed in their stated degree of familiarity with the ideas in the "Learning for Mastery" article, with the Control group claiming the least prior familiarity. The three groups also differed in their perception of how objectives had helped in preparing for the test. Most of this difference was attributable to the response of Control Group indicating that in the absence of objectives, the question was not applicable. A comparison of the Knowledge and Above Knowledge groups on this question indicated no significant difference.

DISCUSSION

The trend in recent years toward the use of objectives, mastery learning, and criterion referenced measurement has many of the earmarks of another education bandwagon phenomena. The zeal for implementation far exceeds the caution that empirical investigations should warrant. The use of objectives have been touted to produce at least two major effects. First, to help the teacher improve instruction and second, to aid the student in learning. Of the studies that have investigated the latter phenomenon, none have attempted to train the subjects in the use of objectives. The current study has taken this step and still failed to show unequivocally favorable effects for the use of objectives. The knowledge objectives group did surpass the above knowledge objectives group on the knowledge level objectives test. But there was no data to suggest a facilitating effect for above knowledge objectives even though most advocates of the use of objectives generally preach setting objectives above the knowledge level of Bloom's taxonomy (Bloom, 1956).

The use of objectives is a complex issue. Rather than attempting to determine the merit or demerit of objectives per se, questions must be raised about the parameters effecting the use of objectives. Skill in the use of objectives is one such variable. In the current study, "knowledgable users" was defined by a person's ability to demonstrate two skills: correctly matching statements of objectives with their respective criterion items and also writing correct criterion items for each of a number of objectives. While both skills could not be performed by those unfamiliar with objectives, being able to perform both skills may not make one a sophisticated user of objectives. Students have taken numerous tests throughout their educational careers without ever using a set of objectives and thus, they should not necessarily be expected to have developed a set of strategies for successful performance that would include the use of objectives. Perhaps matching and writing criterion items with objectives is necessary but not sufficient to influence habitual test-study strategies, at least not in the circumstances of the current study. The self-report questionnaire indicating no difference in the reported helpfulness in the use of objectives for studying, may reflect the difficulty in altering habitual study habits.

The non-significant differences in reading time did not corroborate earlier studies (e.g., Mager and Clark, 1963) indicating that the use of objectives could produce a significant time savings in studying even when there were no significant differences in criterion performance. The dimension of the differences in performance between those who are trained to utilize objectives in various ways in a variety of settings has yet to be researched and may help in our understanding the parameters that effect the utility of objectives as a learning aid.

The results of the current study indicate that the factors which operate in the optimal use of objectives are not well understood at this time. Oversimplified statements by either opponents of proponents of this complex phenomenon are not warranted until the effects are more thoroughly researched and understood.

TABLE 1

Means and Standard Deviations for the Six Treatment Conditions on the Three Dependent Variables

Condition	N	Knowledge Level Test		Above Knowledge Level Test		Reading Time in minutes	
		Mean	SD	Mean	SD	Mean	SD
Knowledge							
University I	10	8.40	1.65	7.90	1.91	46.00	4.80
University II	8	7.50	1.51	7.63	2.56	48.00	2.33
Above Knowledge							
University I	9	5.33	2.00	8.00	1.41	43.33	11.35
University II	7	7.29	2.63	8.00	1.83	47.29	4.27
Control							
University I	9	7.33	1.50	9.11	0.93	44.00	5.96
University II	9	6.11	1.36	7.56	1.42	48.67	1.94

TABLE 2

Analysis of Variance on Knowledge Test, Above Knowledge Test, and Reading Time

EFFECT	df	Knowledge Level Test		Above Knowledge Level Test		Reading Time	
		MS	F	MS	F	MS	F
Treatment	2	14.30	4.48*	2.12	0.71	14.56	0.39
University	1	6.72	2.21	10.89	3.63	98.06	2.65
Interaction	2	12.54	3.93*	2.99	1.00	8.41	0.23
Within	46	3.19					

*$p < .05$

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